

Check Hw in groups then try

$$\frac{2x^4 + 7x^3 - 4x^2 - 27x - 18}{x - 2}$$

$$\begin{array}{r}
 2x^3 + 11x^2 + 18x + 9 \quad \checkmark \\
 x - 2 \overline{) 2x^4 + 7x^3 - 4x^2 - 27x - 18} \\
 \underline{2x^4 - 4x^3} \\
 11x^3 - 4x^2 \\
 \underline{11x^3 - 22x^2} \\
 18x^2 - 27x - 18 \\
 \underline{- 18x^2 + 36x} \\
 9x - 18 \\
 \underline{9x - 18} \\
 0
 \end{array}$$

$$\frac{2x^4 + 7x^3 - 4x^2 - 27x - 18}{x-2}$$

$$\begin{array}{r|rrrrr} 2 & 2 & 7 & -4 & -27 & -18 \\ & \downarrow & 4 & 22 & 36 & 18 \\ \hline & 2x^3 + 11x^2 + 18x + 9 & 0 \end{array} \quad (x-2)(2x^3 + 11x^2 + 18x + 9)$$

$$\begin{array}{r|rrrrr} -3 & 2 & 7 & -4 & -27 & -18 \\ & & -6 & -3 & 21 & 18 \\ \hline & 2 & 1 & -7 & -6 & 0 \end{array} \quad (x+3)(2x^3 + x^2 - 7x - 6)$$

$$\begin{array}{r|rrrrr} 10 & 2 & 7 & -4 & -27 & -18 \\ & & 20 & 270 & 2660 & 26330 \\ \hline & 2 & 27 & 266 & 2633 & 26312 \end{array} \quad \text{Reminder is } f(10)$$

$$2x^3 + 4x^2 + 3x - 8$$

$$2(4)^3 + 4(4)^2 + 3(4) - 8$$

$$128 + 64 + 12 - 8 = 196$$

$$f(4) = 196$$

4	2	4	3	-8
	↓			
	8	48	204	
	2	12	51	196

$$2x^4 + 7x^3 - 4x^2 - 27x - 18 \quad \text{Find the zeros}$$

Rational Zero Test

$$\frac{\text{Factors of last term}}{\text{Factors of first term}} \rightarrow \frac{\pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18}{\pm 1, \pm 2}$$

$$\begin{array}{r|rrrrr} 6 & 2 & 7 & -4 & -27 & -18 \\ & & 12 & 114 & 660 & p.s. \\ \hline & 2 & 19 & 110 & 633 & b.s.p.s. \end{array}$$

Upper bound - front number is positive all the bottom entries are positive

$$\begin{array}{r|rrrrr} -6 & 2 & 7 & -4 & -27 & -18 \\ & & -12 & 30 & -156 & p.s. \\ \hline & 2 & -5 & 26 & -183 & p.s. \end{array}$$

Lower bound - front is neg, and lowest level alternates pos/neg

$$\begin{array}{r|rrrrr} 2 & 2 & 7 & -4 & -27 & -18 \\ & \downarrow & 4 & 22 & 36 & 18 \\ \hline & 2 & 11 & 18 & 9 & 0 \end{array}$$

2 is a zero
(x-2) factor
(2x³ + 11x² + 18x + 9)

$$\begin{array}{r|rrrr} -3 & 2 & 11 & 18 & 9 \\ & \downarrow & -6 & -15 & -9 \\ \hline & 2 & 5 & 3 & 0 \end{array}$$

-3 is zero (x+3) is factor
(x-2)(x+3)(2x² + 5x + 3)
↓
Quad formula

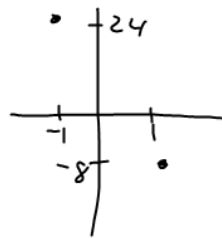
$$3x^3 + 2x^2 - 19x + 6$$

Rational
Zero
Test

$$\frac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 3}$$

$$\begin{array}{r|rrrr} 1 & 3 & 2 & -19 & 6 \\ & \downarrow & & & \\ & 3 & 5 & -14 & \\ \hline & 3 & 5 & -14 & -8 \end{array}$$

$$\begin{array}{r|rrrr} -1 & 3 & 2 & -19 & 6 \\ & \downarrow & & & \\ & 3 & -3 & 1 & 18 \\ \hline & 3 & -1 & -18 & 24 \end{array}$$



$$\begin{array}{r|rrrr} \frac{1}{3} & 3 & 2 & -19 & 6 \\ & \downarrow & & & \\ & 3 & 1 & 1 & -6 \\ \hline & 3 & 3 & -18 & 0 \end{array}$$

$\frac{1}{3}$ is zero $(x - \frac{1}{3})$ factor

$$(x - \frac{1}{3})(3x^2 + 3x - 18)$$

↓
quadratic formula

$$\frac{-3 \pm \sqrt{9 - 4(3)(-18)}}{6} = \frac{-3 \pm \sqrt{225}}{6}$$

$$= \frac{-3 \pm 15}{6} = -3, 2$$

$$(x - \frac{1}{3})(x + 3)(x - 2)$$

zeros $\frac{1}{3}, -3, 2$

Sect. 2.3

#17, 32, 45, 47, 49, 50, 52
hardest

Friday

- Doing more practice

- Descartes' rule of signs (?)

- Read 2.4

- #1-5 (vocab), 1-4, 5, 6, 11, 15-17, 25, 26, 29, 30, 31,
34, 37-41, 47, 50, 65, 67-72(4)